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Plant-Pathogen Interactions and Their Control: Conventional vs. Modern Approach

Dhirendra Kumar
East Tennessee State University, kumard@etsu.edu

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In this special issue of Current Plant Biology, we have compiled several original research and review articles that will provide insights into the advancement in the area of plant-pathogen interaction. These articles will surely enhance our current understanding of diseases caused by a variety of pathogens and new measures used to controls them.

The first article of this special issue by Shao and Tian [1] describes a qPCR based approach to detect and quantify the growth of downy mildew pathogen, *Peronospora belbahrii* during infection in sweet basil. Sweet basil is an economically important popular herb used extensively in various cuisines throughout the world. This pathogen is threatening the cultivation of sweet basil due to lack of genetic resistance and pathogens ability to be distributed through seed. This disease was first reported in 1932 in Uganda and much later in Europe (2003). In the United States, it was first reported in 2007. This disease is significantly affecting the basil industry throughout the whole world.

Article by Chakraborty and Basak [2] describe new insights into Mungbean yellow mosaic India virus resistance by comparative transcriptome profiling of a resistant vs. susceptible *Vigna mungo* cultivar in response to MYMIV infection. Authors used suppression subtractive hybridization to identify differentially expressed transcripts and further verified these transcripts using qPCR.

A review article by Liu and Park [3] describe the interactions between plant roots and parasitic nematodes. Nematodes infestation results in high (~14%) loss in crop production worldwide. Two genus, *Meloidogyne spp*. and *Heterodera spp*. alone cause ~10% loss in yield, amounting to ~80 billion US dollars loss. This review highlights the current status of research in this area and the direction of future research in this area.

An article by Olowe, et al. [4] describes the use of arbuscular mycorrhizal fungi as biocontrol agents against *Fusarium verticillioides* of Maize Ear rot. This disease causes significant damage to yield and quality of corn. Use of biocontrol agents is increasingly becoming popular due to concerns related to the economic costs and adverse health effects related to the use of chemical pesticides.

Andargie et al. [5] describe the mapping of the quantitative trait locus (QTL) conferring resistance false smut disease caused by *Ustilaginiidea virens* in rice. The occurrence of this disease is widespread in many rice growing countries worldwide and the cause of significant yield loss (~3-80%). Rice is a staple food crop in many parts of the world, and any attempt towards minimizing the yield loss and enhancing its quality would be of considerable value to humankind.

An article by Khan and Praveen [6] describes the use of various biocontrol agents along with botanicals to improve the growth and yield of coriander (*Coriandrum sativum* L.) infected with stem gall causing pathogen, *Protomyces macrosporus* Unger. Coriander is widely used as seed spice while the leaves (cilantro) is commonly used in various cuisines throughout the world. This stem gall disease causes 15–27% loss in yield.

Ayodele et al. [7] describe the identification, assessment of diseases and agronomic parameters of *Curcuma amada* Roxb (Mango ginger). Mango ginger is widely used in culinary and medicinal preparations. It is used as an appetizer, diuretic, antipyretic, laxative, asthma and other number of ailments. The major biological activities associated with mango ginger include, antioxidant, antibacterial, antifungal, anti-allergic and platelet aggregation inhibitory activity. This article describes a fungal disease associated with mango ginger.

We hope that the papers published in this special issue illustrate current research in the area of plant pathogen-interaction and this will help in developing sustainable agriculture and inspire future research.

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Dhirendra Kumar
Department of Biological Sciences, Box 70703, East Tennessee State University, Johnson City, TN, 37614-1700, USA
E-mail address: kumard@etsu.edu.

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